

## WHAT IS CLAIMED IS:

1. A field bus module assembly, comprising:
  - (a) a generally rectangular base module (100) adapted for connection with a fixed horizontal support;
  - 5 (b) an input/output module (300); and
  - (c) a generally rectangular connecting module (200) mounting said input/output module on said base module;
  - (d) said base module including:
    - 10 (1) a base body (101) formed of synthetic plastic electrical insulating material, said base body having a lateral projecting portion (114) that is adapted to extend within a corresponding lateral recess (115) contained in an adjacent second base module, said base body having a horizontal lower surface containing an  
15 upwardly extending second recess (106) having a top wall;
    - (2) a plurality of bus bar electrical contacts (102) mounted in transversely-arranged, laterally-spaced relation within said second recess adjacent said top  
20 wall;
    - (3) a horizontal cover member (103) arranged in said second recess below said bus bar electrical contacts, said cover member being spaced upwardly above the horizontal plane containing said base body lower  
25 surface, thereby to define a chamber (110) in the bottom portion of said second recess; and

- (4) a first mass of encapsulating material (M) filling said chamber, thereby to hermetically seal said bus bar electrical contacts against moisture.

2. A field bus module assembly as defined in claim 1, wherein said  
5 input/output module includes a printed circuit board (302); and further wherein said connecting module includes:

- (1) a connecting module printed circuit board (202);  
(2) first electrical connector means (203) mounted on said  
connecting module printed circuit board for connecting said  
10 base module contacts with said input/output circuit board; and  
(3) second connector means (204) for connecting said base  
module contacts with auxiliary sensor means.

3. A field bus module assembly as defined in claim 2, wherein said  
input/output module includes:

- 15 (1) a base (303) supporting said input/output printed circuit  
board; and  
(2) cover means (301) covering said input/output printed circuit  
board.

4. A field bus module assembly as defined in claim 1, wherein said first  
20 recess (115) is contained in the edge between said bottom wall and one side wall of  
said base module, whereby when a plurality of said base modules are laterally  
connected in a row, the end base module of the row can be disconnected from the  
adjacent base module only by vertical displacement of said end base module.

5. A field bus module assembly as defined in claim 4, wherein said base module projecting portion (114) carries an upwardly projecting portion (121) that is adapted to extend within a corresponding recess (122) contained in the top wall of the first recess contained in the adjacent base module.

5 6. A field bus module assembly as defined in claim 1, wherein said base module projecting portion (114) contains a first row of transversely arranged first through bores (113) opposite corresponding ends of said bus bar electrical contacts, respectively, and wherein the portion of said base module containing said first recess contains a transversely arranged second row of second through bores (111) parallel  
10 with said first through bores, said second through bores being arranged for communication with the first through bores of an adjacent assembled base module.

7. A field bus module assembly as defined in claim 6, wherein said base module contains a third row of transversely arranged third through bores (112) between and parallel with said first and second rows of through bores, the other ends  
15 of said bus bar electrical contacts being arranged beneath said third through bores, respectively; and further wherein said connecting module (200) includes:

- (1) a horizontal connecting module printed circuit board (202); and
- (2) a plug connector (203) carried by said connecting module printed circuit board, said plug connector having two rows of transversely  
20 arranged vertical contact pins (205) opposite and extending through said second and third through bores, respectively.

8. A field bus module assembly as defined in claim 7, wherein said bus bar electrical contacts (102) include horizontal center portions (104), and resilient

tulip-shaped female terminals (105) that extend upwardly from the ends of said bus bar electrical contacts beneath said second and third rows of through bores for engagement by said connecting module vertical contact pins (205) , respectively.

9. A field bus module assembly as defined in claim 8, wherein the top  
5 wall of said base module second recess (106) contains two rows of transversely arranged through pockets (107) for receiving said tulip-shaped resilient female terminals, respectively.

10. A field bus module assembly as defined in claim 7, wherein said base  
10 module second recess contains a plurality of alignment openings (109) for receiving corresponding alignment pins on said cover member, respectively.

11. A field bus module assembly as defined in claim 7, and further  
wherein said base module contains a continuous groove (116) surrounding at least one row of said through bores (111, 112, 113), and a resilient seal member (S) mounted in said groove, the adjacent base module having a continuous rib (120)  
15 opposite said groove for compressing said seal when said base modules are connected together.

12. A field bus module assembly as defined in claim 7, wherein said  
connecting module further includes:

(3) a rectangular housing (201) the bottom of which contains a  
20 chamber (210) receiving said connecting module printed circuit board (202);

- 5 (4) a rectangular sealing frame (206) arranged in said chamber beneath said connecting module printed circuit board, said sealing frame extending beneath the periphery of said first electrical connector means (203), said sealing frame having an open center portion defining a second chamber receiving said pin contacts; and
- (5) a second mass of encapsulating sealing material (M') filling said second chamber, thereby to hermetically seal the space between said pin contacts.

10 13. A field bus module assembly as defined in claim 12, wherein said connecting module housing (201) includes a plurality of locator pins (208) that extend toward corresponding recesses (123) contained in the adjacent surface of said base module housing.

15 14. A field bus module assembly as defined in claim 12, wherein the bottom surface of said sealing frame contains a continuous second groove (212) extending about the periphery thereof, and a second resilient seal member (S') mounted in said second groove.

20 15. A field bus module assembly as defined in claim 12, wherein said sealing frame includes at least one locator pin (213) arranged for cooperation with a corresponding recess (214) contained in an opposing surface of said connecting module body.

16. A field bus module assembly as defined in claim 12, wherein said sealing frame contains a plurality of through bores (216) receiving said contact pins, respectively, said sealing frame also including a plurality of spacer pins (217) that engage the connecting module printed board to space said sealing frame from said circuit board, said second sealing mass extending within and filling said space and the space between said contact pins, thereby to completely seal and encapsulate the bottom of said connecting module.

17. A field bus module assembly as defined in claim 1, and further including means for securing said base module to the fixed support, means for connecting said connecting module with said base module, and means connecting said input/output module with said base unit via said connecting module.

18. A field bus module assembly as defined in claim 1, and further including a pair of sealing bead means for sealing the connecting module with each of said base and input/output modules, respectively.